

REMARKS

Claims 1, and 3 - 7 are now pending in the application. Minor amendments have been made to the specification and claims to simply overcome the objections to the specification and rejections of the claims under 35 U.S.C. § 112. The amendments to the claims contained herein are of equivalent scope as originally filed and, thus, are not a narrowing amendment. The Examiner is respectfully requested to reconsider and withdraw the rejection(s) in view of the amendments and remarks contained herein.

SPECIFICATION

The Abstract Section of the specification was replaced to be in conformity of the proper language and format for an abstract of a disclosure.

The remainder of the specification of the application were replaced to address spelling and grammatical mistakes. Applicant also includes herewith a marked up version of the specification highlighting each of the changes made to the specification. Pursuant to 37 CFR 1.125(b)(1), no new matter has been added.

REJECTION UNDER 35 U.S.C. § 112

Claims 1-3 stand rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point and distinctly claim the subject matter which Applicant regards as the invention. More specifically, the Examiner noted a discrepancy in the claims appearing to be written "toward a subcombination...while the body of the claims has language which seems to suggest a combination between the apparatus and

other structures.” Applicant has amended the rejected claims to overcome this rejection.

REJECTION UNDER 35 U.S.C. § 102

Claims 1-3 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Struble (U.S. Pat. No. 4,015,454). This rejection is respectfully traversed.

The Struble reference depicts a latching assembly for latching the swingable door associated with a cap as mounted over the bed of a pickup truck. The present invention relates to the preservation of a subglass of a driving room of heavy equipment. Important differences between the present application and the prior art is that Struble is not detachable, does not include or relate to the use or preservation of a subglass, and does not relate to a driving room of a heavy equipment.

The present invention has an upper bracket and a lower bracket both attached to upper and lower portion, respectively, of the inner surface of an entrance door of a driving room. A locking apparatus is attached to the upper portion of the inner surface of the entrance door, which detachably supports the upper portion of the subglass. Struble has a pair of spaced parallel frame elements, one of which is hingedly connected to the vehicle cap. The Examiner refers to the pianotype hinge (28) of Struble as equivalent to the locking apparatus of the present apparatus. Applicant respectfully maintains that not only is the hinge not detachable, it is also on the outside of the swingable door, where the present invention has the apparatus on the inside of the door in order to accommodate full detachment and removal of the subglass by the driver while inside the driving room.

Applicant further notes another important difference in that Struble has a separate handle (31) which is distinct and not connected with its hinge, or locking apparatus (28). The purpose of the handle is to enable the opening of a swinging cab door. The present invention combines the handle with a locking apparatus. The purpose of the handle in the present invention is to either secure a subglass in its place or to allow the detachment and removal of a subglass altogether. Additionally, the handle in Struble is designed to enable the opening of the door from both the interior and exterior. The present invention has the handle attached to and operable from the interior of the upper portion of the entrance door only. Applicant has further amended claim 1 to more clearly distinguish the detachable locking apparatus which patently distinguishes Applicant's claimed invention from Struble.

The prior art fails to disclose such a locking apparatus that includes a handle which detachably supports a subglass attached to the inner surface of an entrance door of a driving room of a heavy equipment. Accordingly, Applicant respectfully requests that the Examiner reconsider and withdraw this rejection.

CONCLUSION

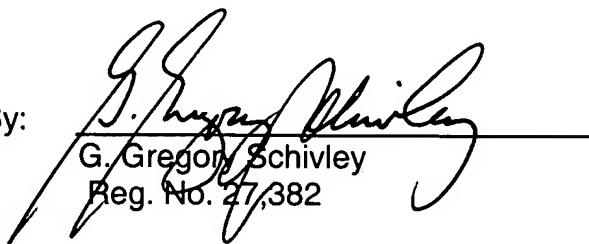
It is believed that all of the stated grounds of rejection have been properly traversed, accommodated, or rendered moot. Applicant therefore respectfully requests that the Examiner reconsider and withdraw all presently outstanding rejections. It is believed that a full and complete response has been made to the outstanding Office Action, and as such, the present application is in condition for allowance. Thus, prompt and favorable consideration of this amendment is respectfully requested. If the

Examiner believes that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at (248) 641-1600.

Respectfully submitted,

Dated: Oct 14, 2003

By: _____


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[GGS/AEP]



SUBSTITUTE SPECIFICATION (Marked up version)

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BACKGROUND OF THE INVENTION

1. Field of the Invention

[0001] The present invention relates to an apparatus for preserving a subglass ~~of a driving room of a heavy equipment which is installed in an inner side of an entrance door of a driving room and~~ of a heavy equipment. It is capable of safely preserving a subglass in a driving room in the case ~~that~~ where a subglass, which is detachably installed in a lower portion of a front surface of a driving room of a heavy equipment, is separated based on a working environment.

2. Description of the Background Art

[0002] ~~Generally, as shown in Figure 1, in~~ 1 generally shows a conventional apparatus for preserving a subglass of a driving room of a heavy equipment, ~~in.~~ In the case ~~that~~ where a detachable subglass ~~100 which is detachably~~ 100, installed in a lower portion of a front surface of a driving room ~~10~~ 10, is separated based on a working environment, the subglass 100 is overlaid with a rear glass 11 using a locking apparatus ~~20~~ 20, or is fixed in an inner surface of a panel (not shown) which forms the driving room ~~100~~ 10.

[0003] In the drawings, reference numeral 12 represents a control box having a driving control adjusting lever of a heavy equipment.

[0004] In the conventional apparatus ~~for preserving a subglass of a driving room of a heavy equipment capable of overlaying~~ where the subglass 100 is overlaid with the rear glass 11 of the driving room 10 ~~for thereby preserving~~ in order to preserve the subglass, ~~in the case that~~ if the heavy equipment has an accident and is inverted while preserving the subglass in the above manner, a driver of the heavy equipment

must avoid the ~~above~~an accident. In this case, since the subglass is positioned directly above the head of the driver, ~~the subglass is an external impact applied to the subglass~~ may cause the subglass to be directly dropped onto the upper body of the driver ~~due to an external impact applied to the subglass, so that, and~~ the driver may ~~receive a critical damage. In addition, in order to preserve the subglass~~be injured. Additionally, when the subglass 100 of a weight of 6~7kg is preserved in a narrow driving room, subjected to a weight of 6~7kg, the subglass may ~~be dropped, so that drop, and~~ the driver may be ~~damaged~~injured.

[0005] ~~In another~~Another conventional apparatus for preserving a subglass of a driving room of a heavy equipment in which the subglass is preserved in a side of the driving room, ~~in the case that an apparatus is installed for preserving a subglass of a driving room of a heavy equipment, is where~~ an inner width(920mm) of a driving room of a heavy equipment ~~must meet the requirement of the ISO. In addition~~complies with the ISO requirements (920mm). In this case, a sharp corner portion of the subglass is always near the driver, ~~so that a certain~~which could lead to an accident ~~may occur~~. Since the subglass is positioned at ~~the a~~a height similar ~~with the height to that~~ of the head of the driver, ~~the driver may be critically damaged due to a particle~~particles of the broken subglass may critically injure the driver during an accident.

SUMMARY OF THE INVENTION

[0006] Accordingly, it is a first object of the present invention to provide an apparatus for preserving a subglass of a driving room of a heavy equipment which overcomes the ~~preelbmes~~problems encountered in the conventional art.

[0007] It is a second object of the present invention to provide an apparatus for preserving a subglass of a driving room of a heavy equipment ~~which is capable of safely~~

~~preserving a subglass of a driving room of a heavy equipment, installed in a lower portion of a front surface of a driving room of a heavy equipment and is, separated based on a working environment and is capable of decreasing a damage in the case that, which decreases the risk of any injury if an accident occurs and. This is accomplished by implementing an easiera easy operation for attaching and detaching operation of a subglass.~~

[0008] To achieve the above objects, ~~therean~~ an apparatus is provided ~~an apparatus~~ for preserving a subglass of a driving room of a heavy equipment which includes a lower bracket ~~which is,~~ attached to a lower portion of an inner surface of an entrance door of a driving room ~~and forms a mounting groove which is,~~ forming an upwardly opened mounting groove used for inserting and supporting a lower portion of the subglass ~~therein and supports the subglass inserted in the mounting groove,;~~ an upper bracket ~~which is installed on the,~~ attached to an upper portion of ~~the lower bracket in an inner surface of the entrance door of the driving room and supports,~~ supporting an upper portion of the inner surface of the subglass inserted in the lower bracket; and a locking apparatus ~~which is installed in,~~ attached to an upper portion of the inner surface of the entrance door of the driving room ~~and, which detachably supports an upper portion of the outer surface of the subglass closely contacted,~~ in close contact with the upper bracket ~~in a state that it,~~ where said subglass is inserted in the mounting groove of the lower bracket in ~~the apparatus for preserving a subglass of a driving room of a heavy equipment installed for temporarily preserving a subglass of a driving room of a heavy equipment in a certain temporary portion of a driving room~~ said apparatus.

[0009] The locking apparatus includes a fixing member attached to an inner surface of the entrance door of the driving room, a handle in which a rear end of the same is rotatably engaged to the fixing member, a support member which is protruded

from an inner surface of the handle and is integrally rotated with the handle and support an outer surface of the subglass, and a handle limiting means for limiting the rotation of the handle.

[0010] The handle limiting means includes a limiting rod which has one end axially engaged with the fixing member based on a rotation and axial direction movement and the other end engaged with the handle based on an axial direction movement for thereby rotatably fixing the handle to the fixing member based on a downward rotation in a limited angular range, and a compression spring which elastically supports the limiting rod with respect to the fixing member and controls the axial direction movement of the limiting rod so that the engaging shoulder portion formed in the limiting rod is inserted in the engaging groove of the fixing member at a maximum downward rotation angle of the limiting rod.

BRIEF DESCRIPTION OF THE DRAWINGS

[0011] The present invention will become better understood with reference to the accompanying drawings which are given only by way of illustration and thus are not limitative of the present invention, wherein;

[0012] Figure 1 is a lateral cross-sectional view and back view illustrating a driving room of a heavy equipment in which a conventional apparatus for preserving a subglass of a driving room of a heavy equipment is installed;

[0013] Figure 2 is a lateral cross-sectional view illustrating a driving room of a heavy equipment in which an apparatus for preserving a subglass of a driving room of a heavy equipment according to the present invention is installed;

[0014] Figure 3 is a cross-sectional view taken along line H III-H III of Figure 2;

[0015] Figure 4A is a front view illustrating a subglass of an apparatus for

preserving a subclass of a driving room of a heavy equipment according to the present invention;

[0016] Figure 4B is a cross-sectional view taken along line X-X of Figure 4A;

[0017] Figure 5A is a front view illustrating an upper bracket of an apparatus for preserving a subclass of a driving room of a heavy equipment according to the present invention;

[0018] Figure 5B is a cross-sectional view taken along line Y-Y of Figure 5A;

[0019] Figure 6A is a lateral view illustrating a locking apparatus of an apparatus for preserving a subclass of a driving room of a heavy equipment according to the present invention;

[0020] Figure 6B is a view illustrating an operation of an apparatus for preserving a subclass of a driving room of a heavy equipment according to the present invention;

[0021] Figure 7A is a lateral cross-sectional view which illustrates a handle locking state of an apparatus for preserving a subclass of a driving room of a heavy equipment according to the present invention and which is taken along line VII-VII of Figure 6A and is a back view of the same;

[0022] Figure 7B is a lateral cross-sectional view which illustrates a handle unlocking state of an apparatus for preserving a subclass of a driving room of a heavy equipment according to the present invention and which is taken along line VII-VII of Figure 6A.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0023] The preferred embodiments of the present invention will be explained with reference to the accompanying drawings.

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[0024] As shown in Figures 2 and 3, an apparatus for preserving a subglass of a driving room of a heavy equipment is constructed in such a manner that in the case that a subglass is separated based on a working environment, the subglass is safely preserved. The apparatus for preserving a subglass of a driving room of a heavy equipment includes a lower bracket 1 which is attached to a lower portion of an inner surface of a driving room entrance room 13 and forms a mounting groove 1a which is upwardly opened, an upper bracket 2 which is installed in the upper portion of the lower bracket 1 and to which a buffering material 2a of a rubber material is attached on the surface of the same, and a locking apparatus 3 which is fixed to the driving room entrance door 13 together with the upper bracket 2 and locks and unlocks the subglass 100 inserted between the lower bracket 1 and the upper bracket 2. The upper bracket 2 is installed in a portion lower than the waist of the driver when the driver ~~seats for preventing~~is seated to prevent the driver from being ~~damaged~~injured by the subglass 100 ~~when~~if an accident occurs.

[0025] As shown in Figures 3 and 4, the lower bracket 1 is fixedly attached to a lower portion of the inner surface of the driving room entrance door 13 and forms the mounting groove 1a which is upwardly opened and supports the lower portion of the subglass 100 inserted in the mounting groove 1a. Preferably, the lower bracket 1 is formed of a rubber material for protecting the subglass 100 from an external impact. The mounting groove 1a is formed in such a manner that a torque is applied in the outward direction with respect to the subglass 100 inserted in the mounting groove 1a.

[0026] As shown in Figures 3 and 5, the upper bracket 2 supports an upper portion of an inner surface of the subglass 100 which is inserted in the subglass 1 and is closely contacted in the direction of the driving room entrance door 12 and has a buffering material 2a formed of a rubber material for absorbing an external impact in a

surface contacting with the subglass 100.

[0027] As shown in figure 3, the locking apparatus 3 contacts with the surface of the upper bracket 2 and is fixed to the entrance door 13 together with the upper bracket 2. As shown in Figures 6A and 6B, the locking apparatus 3 includes a fixing member 31 attached to an inner surface of the entrance door 13 together with the upper bracket 2, a handle 30 which is installed in the fixing member 31 and rotatable in a limited angular range, a limiting member for selectively limiting the rotation of the handle 30, and a support member 32 which is protruded from an inner surface of the handle 30 and directly supports an upper portion of the outer surface of the subglass 100 and is formed of an elastic material.

[0028] As shown in Figures 7A and 7B, the handle limiting member includes a limiting rod 33 which is inserted in a through hole 31a formed in the center of the fixing member 31 and rotatably engages the handle 30 engaged to the end portion of the same to the fixing member 31, and a compression spring 34 which elastically supports the limiting rod 33 with respect to the fixing member 31.

[0029] An escape prevention shoulder portion 33a is installed in a rear end of the limiting rod 33 for preventing an escape of the limiting rod 33. An engaging shoulder portion 33b is protruded in an axial direction and is formed in one side of the escape prevention shoulder portion 33a. In addition, an engaging groove 31b which has the same phase as the engaging shoulder portion 33b at a maximum downward rotation angle of the limiting rod 33 is formed in the fixing member 31.

[0030] In the handle limiting members 31b, 33, 34 and 33b, in the case that the handle 30 is downwardly rotated in maximum, namely, in the case that the support member 32 which is rotated together with the handle 30 supports an outer surface of the subglass 100 inserted in the lower bracket 1, as shown in Figure 7A, the engaging

shoulder portion 33b of the limiting rod 33 rotated together with the handle 30 and the engaging groove 31b of the fixing member 31 are same. Therefore, the driving rod 33 is moved in an axial direction by an elastic force of the compression spring 34, and the engaging shoulder portion 33b of the limiting rod 33 is inserted into the engaging groove 31b of the fixing member 31 for thereby limiting the limiting rod 33 with respect to the fixing member 31, so that the handle 30 is not rotated.

[0031] In the thusly constituted apparatus for preserving a subglass of a driving room of a heavy equipment according to the present invention, the subglass 100 separated from the lower portion of the front surface of the driving room of the heavy equipment is engaged or disengaged in the inner surface of the driving room entrance door 13 in the following method.

[0032] In the case that the subglass 100 is separated and fixed to the driving room entrance door 13 using the apparatus for preserving the subglass 100 of the ~~driving~~driving room of the equipment according to the present invention, first, in a state that the handle 30 is upwardly rotated in maximum, the subglass 100 is inserted into the lower bracket 1 and is pushed in the direction of the entrance door 1, so that an upper portion of the inner surface of the subglass 100 is closely contacted with the buffering material 2a of the upper bracket 2, and the subglass 100 is temporarily fixed between the lower bracket 1 and the upper bracket 2. In this state, when the handle 30 is downwardly rotated in maximum, the front end of the support member 32 which is rotated together with the handle 30 is closely contacted with the upper portion of the outer surface of the subglass 100 for thereby supporting the upper portion of the subglass 100. Therefore, the subglass 100 inserted between the upper and lower brackets is not escaped using the support member 32 of the handle 30. At this time, in the handle limiting members 31b, 33, 34 and 33b, as the engaging shoulder portion 33b

of the limiting rod 33 which is rotated at the maximum downward rotation angle together with the handle 30 and the engaging groove 31b formed in the fixing member 30 have the same phase, the limiting rod 33 is moved in the axial direction in the outward direction by an elastic force of the compression spring 34. As shown in Figure 7a, the engaging shoulder portion 33b is inserted into the engaging groove 31b of the fixing member 31 and is not rotated in a state that the limiting rod 33, namely, the handle 30 is limited by the fixing member 31, and the support member 32 supports the subglass 100.

[0033] On the contrary, when disengaging the subglass 100 fixed to the apparatus for preserving a subglass of a driving room of a heavy equipment, first, the front end of the limiting rod 33 which is outwardly protruded is pushed using a thumb by holding the handle 30, so that the engaging shoulder portion 33b of the limiting rod 33 is escaped from the engaging groove 31b of the fixing member 31 as shown in Figure 7B. In a state that the front end of the limiting rod 33 is pressed, namely, in a state that the limiting rod 33 is in a free rotation state, when the subglass 100 is upwardly rotated along the dotted line of Figure 6B for escaping the handle 30 from the subglass 100, the support member 32 is escaped from the subglass 100 together with the handle 30 for thereby implementing a unlocking state with respect to the subglass 100. The subglass 100 which is simply inserted in the subglass 1 and is in a detachable state is lifted for thereby being escaped from the entrance door 13.

[0034] As described above, in the apparatus for preserving a subglass of a driving room of a heavy equipment according to the present invention, since it is possible to preserve a subglass of a front surface of a driving room which is separated based on a working environment is a lower portion of an inner surface of an entrance door lower than the working position of a driver, it is possible to improve a stability by decreasing a damage due to a subglass when an ~~acid~~accident occurs. In addition,

since an apparatus for preserving a subglass of a driving room of a heavy equipment according to the present invention is installed in an inner surface of the entrance door, in a state that the entrance door is opened, it is possible to engage and disengage the subglass in an outdoor, and it is possible to implement an easier locking operation and is possible to easily disengage the subglass.

[0035] As the present invention may be embodied in several forms without departing from the spirit or essential characteristics thereof, it should also be understood that the above-described embodiments are not limited by any of the details of the foregoing description, unless otherwise specified, but rather should be construed broadly within its spirit and scope as defined in the appended claims, and therefore all changes and modifications that fall within the meets and bounds of the claims, or equivalences of such meets and bounds are therefore intended to be embraced by the appended claims.

ABSTRACT OF THE DISCLOSURE

~~The present invention relates to an apparatus for preserving a subglass of a driving room of a heavy equipment which is~~An apparatus installed in an inner side surface of an entrance door of a driving room for safely preserving a subglass when the subglass, which is detachably installed in a lower portion of a front surface of a driving room of a heavy equipment, is separated based on a working environment. The apparatus ~~for preserving a subglass of a driving room of a heavy equipment~~ includes a lower bracket ~~which is attached to a lower portion of an inner surface of an entrance door of a driving room and forms~~the door, forming a mounting groove ~~which is~~ upwardly opened for inserting a lower portion of the subglass therein, and supports the subglass inserted in the mounting groove; an upper bracket ~~which is~~ installed on the upper portion of the lower bracket ~~in an inner surface of the entrance door of the driving room and supports~~supporting an upper portion of the inner surface of the subglass inserted in the lower bracket; and a locking apparatus ~~which is~~ installed in an upper portion of the ~~inner surface of the entrance door of the driving room and~~door, which detachably supports an upper portion of the outer surface of the subglass ~~closely contacted with the upper bracket in a state that it is inserted in the mounting groove of the lower bracket in~~
~~the apparatus for preserving a subglass of a driving room of a heavy equipment installed for temporarily preserving a subglass of a driving room of a heavy equipment in a certain temporary portion of a driving room.~~